



**INPRO**  
International Project on  
Innovative Nuclear Reactors  
and Fuel Cycles

# **17th INPRO Dialogue Forum on Opportunities and Challenges in Small Modular Reactors**

**Hosted by the**  
Government of the Republic of Korea

**through the**  
Ulsan National Institute of Science and Technology

**Lotte Hotel Ulsan**  
**Ulsan City, Korea, Republic of**

**2-5 July 2019**

**Ref. No.: EVT1803515**

## **Information Sheet**

### **A. Introduction**

The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) was established through a General Conference resolution in 2000 (GC(44)/RES/21, 2000) to support efforts leading to the long term sustainability of nuclear energy so that it can help meet the rapidly growing energy needs of Member States in the 21st century. To achieve this outcome, INPRO supports Member States in their long-term planning for deploying sustainable nuclear energy. It provides direct support related to advanced and innovative nuclear energy system scenario modelling, analysis, and sustainability assessment using the INPRO Methodology and through facilitating dialogue, cooperation and collaboration among Member States in their respective roles as nuclear energy technology developers, suppliers and customers.

Four tasks are reflected in the INPRO Subprogramme Plan for 2018–2019, as endorsed by the INPRO Steering Committee: Task 1: Global Scenarios; Task 2: Innovations; Task 3: Sustainability Assessment and Strategies; and Task 4: Dialogue and Outreach.

There are increasing interests in the development and deployment of small modular reactors (SMRs) as a cleaner alternative to fossil fuels and reducing greenhouse gas emissions. SMRs are newer generation reactors designed to generate electric power up to 300 MW, whose components and systems can be shop fabricated and then transported as modules to the sites for installation. Modular reactors allow for less on-site construction, increased containment efficiency, and heightened nuclear materials security. SMRs have been proposed as a less expensive alternative to conventional nuclear reactors. SMRs could fulfil the need of flexible power generation for a wide range of users and applications, including replacing aging fossil power plants, providing cogeneration for countries with smaller electricity grids as well as regions with less developed infrastructure and for energy systems that combine nuclear and alternative sources, including renewables.

Significant advances have been made in recent years on SMRs. Currently there are more than 50 SMR designs at various stages of development for different applications, with commercial operations expected to begin in the coming years.

Though significant advancements have been made in various SMR technologies in recent years, some technical issues still attract attention in the industry. These include for example control room staffing and human factor engineering for multi-module SMR plants, defining the source term for multimodule SMR plants with regards to determining the emergency planning zone, developing new codes and standards, and load-following operability aspects. Some potential advantages of SMRs like the elimination of public evacuation during an accident or a single operator for multiple modules are under discussion with regulators. Furthermore, although SMRs have lower upfront capital cost per unit, their generating cost of electricity will probably be substantially higher than that for large reactors. Their costs will be weighed against alternatives and competitiveness will need to be pursued through economics of scale. The deployment of SMRs will involve the development of a resilient supply chain, human resources and a robust regulatory framework.

The INPRO Steering Committee, at its 27th meeting in October 2018, endorsed the organization of an INPRO Dialogue Forum on Opportunities and Challenges in SMRs to be held in Korea, Republic of in 2019.

The meeting will mainly consist of two parts: A Dialogue Forum and technical tours to local nuclear industries and nuclear power plants. The Dialogue Forum includes keynote speeches by the invited speakers, presentations by the participants from Member States, and discussions among participants representing interested Member States and international organizations.

## **B. Objectives**

The INPRO Dialogue Forum offers a platform for technology holders, technology users and other stakeholders from all IAEA interested Member States and facilitates discussion so that technology holders can better understand the needs and concerns of technology users, and users can better understand the possibilities and limitations of technology holders associated with the development and deployment of innovative nuclear energy systems.

The Dialogue Forum will focus not only on technology, but also institutional aspects, such as market, resources, effects of regulation and public acceptance issues.

The objectives of this 17th INPRO Dialogue Forum are as follows:

- To discuss and share information and knowledge on current status and potential SMRs and its role in the energy market (also beyond electricity generation) with a broad set of participant perspectives including technology developers and potential suppliers and customers;
- To promote an open dialogue on the national, regional and global opportunities while highlighting key challenges in development and deployment of SMRs (including investment and financial models);

- To explore the different perspectives of participants regarding these opportunities and challenges through structured breakout group dialogue sessions;

## C. Expected Outputs

The expected outputs of the 17th INPRO Dialogue Forum are as follows:

- To summarize in the meeting report, the national, regional and global opportunities and challenges in on-going SMR development including: existing and planned investment and financing, licensing status, demonstration plans, and related R&D on key challenges;
- To update, through dialogue, the Agency's and the Member States' broader understanding of future energy market prospects of SMRs and associated innovative nuclear energy systems and coupling with the larger energy system;
- To draw up recommendations for the IAEA Secretariat regarding any additional activities that the Agency might engage to support Member States in their development of SMRs and their specific applications.

## D. Expected Participation

The INPRO Dialogue Forum is open to participants from the IAEA Member States, especially those from the following INPRO Members:

Algeria, Argentina, Armenia, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Czech Republic, Egypt, France, Germany, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Korea, Republic of, Malaysia, Mexico, Morocco, Netherlands, Pakistan, Poland, Romania, Russian Federation, Slovakia, South Africa, Spain, Switzerland, Thailand, Turkey, Ukraine, the United States of America and Viet Nam,

observers and the interested Member States:

Albania, Australia, Austria, Bolivia, Cambodia, Croatia, Cuba, Ecuador, Estonia, Ethiopia, Finland, Ghana, Georgia, Hungary, Iran, Jamaica, Latvia, Libya, Lithuania, Mongolia, Namibia, Nigeria, Norway, Oman, Paraguay, Peru, Philippines, Saudi Arabia, Senegal, Serbia, Singapore, Slovenia, Sri Lanka, Sweden, Sudan, Tunisia, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, Uruguay,

as well as from the following organizations:

the European Atomic Forum (FORATOM), the European Commission (EC), the Generation IV International Forum (GIF), the International Framework for Nuclear Energy Cooperation (IFNEC), the Multinational Design Evaluation Programme (MDEP), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), the Sustainable Nuclear Energy Technology Platform (SNETP), the Western European Nuclear Regulators Association (WENRA), the World Association of Nuclear Operators (WANO), and the World Nuclear Association (WNA).

## E. Participation and Registration

All persons wishing to participate in the event must be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

To be designated by an IAEA Member State, participants are requested to send the Participation Form (Form A) to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **30 April 2019**. They should be sent to the Scientific Secretaries of the Dialogue Forum by email

to: [B.Kim@iaea.org](mailto:B.Kim@iaea.org) with a copy to: [K.Robinson-Onorati@iaea.org](mailto:K.Robinson-Onorati@iaea.org). Participants who are members of an organization invited to attend are requested to send the Participation Form (Form A) through their organization to the IAEA by above deadline.

Selected participants will be informed in due course on the procedures to be followed regarding administrative and financial matters.

Please note that the IAEA is in a transition phase to manage the entire registration process for all regular programme events electronically through the new InTouch+ (<https://intouchplus.iaea.org>) facility, which is the improved and expanded successor to the InTouch platform that has been used in recent years for the IAEA's technical cooperation events. Through InTouch+, prospective participants will be able to apply for events and submit all required documents online. National authorities will be able to use InTouch+ to review and approve these applications. Interested parties that would like to use this new facility should write to: [InTouchPlus.Contact-Point@iaea.org](mailto:InTouchPlus.Contact-Point@iaea.org).

The Dialogue Forum is, in principle, open to all officially designated persons. The IAEA, however, reserves the right to limit participation should this become necessary due to limitations imposed by the available seating capacity. It is therefore recommended that interested persons take the necessary steps to obtain their official designation as early as possible.

## F. Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics.

When completing the Participation Form please indicate whether you are planning to give a presentation and participate in an optional technical tour. Participants who intend to give presentations are requested to submit the **Form for Submission of a Presentation (Form B)** together with the **Participation Form (Form A)**. The Scientific Secretary may contact participants to discuss the content of their presentations. Also, in accordance with the IAEA's policy, all presentations and other files should be uploaded on a computer used at a meeting room in advance. Therefore, the presentations and any other supplementary files should be sent to the Scientific Secretary by email not later than **31 May 2019** (Microsoft PowerPoint files are preferable, although PDF format may also be used). When submitting the files electronically, please note that the size of a message should not exceed 5 MB.

## G. Working Language

The working language of the Dialogue Forum will be English with limited interpretation into Korean. All communications, abstracts and papers must be submitted in English.

## H. Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made using the **Grant Application Form (Form C)** which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A)** by **30 April 2019**.

## I. Venue

The Dialogue Forum will commence at 9.30 a.m. on Tuesday, 2 July 2019, Lotte Hotel Ulsan, Ulsan City, Korea, Republic of (282, Samsan-ro, Nam-gu, Ulsan City, 44719 Korea, Republic of/ Tel: +82 52 960-1000 / [www.lottehotel.com/ulsan-hotel/en.html](http://www.lottehotel.com/ulsan-hotel/en.html)).

## J. Visas

Participants who need a visa for entering Korea, Republic of should submit the necessary application to the nearest diplomatic or consular representative of Korea, Republic of as early as possible, along with the invitation letter from the Agency.

## K. Organization

This Dialogue Forum will be organized by the IAEA in collaboration with the Government of the Korea, Republic through the Ministry of Science and ICT and Ulsan National Institute of Science and Technology (UNIST).

Official correspondence regarding the technical aspects of the Dialogue Forum should be addressed to the Scientific Secretaries:

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